

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): Steel block for the manufacture of moulds for the injection moulding of plastics material or the moulding of metals or for the manufacture of metal-working parts, having a thickness greater than 20 mm, of which the structure is completely martensitic or martensite-bainitic, of which the hardness at all points is between 430 HB and 530 HB and of which the chemical composition of the steel comprises, in % by weight:

$$0.180\% \leq C \leq 0.400\%$$

$$\text{Si} \leq 0.8\%$$

$$\text{Mn} \leq 2.5\%$$

$$\text{Ni} \leq 3\%$$

$$\text{Cr} \leq 3.5\%$$

$$\text{Mo} + \text{W}/2 \leq 2.8\%$$

$$\text{V} + \text{Nb}/2 + \text{Ta}/4 \leq 0.5\%$$

$$\text{Al} \leq 0.4\%$$

$$\text{Ti} + \text{Zr}/2 \leq 0.1\%$$

- boron in a content of between 0.0005% and 0.015%,
- optionally one or more elements from among sulphur, selenium and tellurium, the sum of contents of these elements being less than or equal to 0.2%,

– optionally one or more elements from among lead and bismuth, the sum of contents of these elements being less than or equal to 0.2%,

– optionally calcium in a content of less than or equal to 0.1%,

the remainder being iron and impurities resulting from production, the copper being an impurity,

the chemical composition also satisfying the following equations:

$$3.2 \leq \text{Tr} \leq 9$$

$$85 \leq \text{Dr} \leq 95$$

$$\text{U}/\text{Dr} \leq 10.0$$

$$\text{Mo}^* + 3 \times \text{V}^* \geq 0.4\%$$

in which, for contents expressed in %:

$$\text{Tr} = 1.8 \times \text{C} + 1.1 \times \text{Mn} + 0.7 \times \text{Ni} + 0.6 \times \text{Cr} + 1.6 \times \text{Mo}^* + \text{K}$$

wherein $\text{K} = 0$ if the steel does not contain boron and $\text{K} = 0.5$ if the steel contains boron

$$\text{Dr} = 54 \times \text{C}^{0.25} + 24.5 \times (\text{Mo}^* + 3 \times \text{V}^*)^{0.30} + 1.58 \times \text{Mn} + 0.74 \times \text{Ni} + 1.8 \times \text{Si} + 12.5 \times (\text{Cr})^{0.20}$$

$$\text{U} = 1600 \times \text{C} + 100 \times (0.25 \times \text{Cr} + \text{Mo}^* + 4.5 \times \text{V}^*)$$

$$\text{R} = 3.8 \times \text{C} + 10 \times \text{Si} + 3.3 \times \text{Mn} + 2.4 \times \text{Ni} + 1.4 \times (\text{Cr} + \text{Mo}^*)$$

$$\text{Mo}^* = \text{Mo} + \text{W}/2$$

$$\text{V}^* = \text{V} + \text{Nb}/2 + \text{Ta}/4$$

the contents of boron, aluminium, titanium, zirconium and nitrogen, expressed in thousandths of

% by weight, being such that:

$$\text{B} \geq \frac{1}{3} \times \text{K1} + 0.5$$

wherein $\text{K1} = \text{Min}(\text{I}^*; \text{J}^*)$

$$\text{I} = \text{Min}(\text{N}; \text{N} - 0.29(\text{Ti} + \text{Zr}/2 - 5))$$

$$J = \text{Min} \left(N; 0.5 \left(N - 0.52 \text{ Al} + \sqrt{(N - 0.52 \text{ Al})^2 + 283} \right) \right)$$

2. (original): Steel block according to claim 1, of which the chemical composition is such that

$$R > 11$$

3. (currently amended): Steel block according to ~~claim 1 or claim 2~~ claim 1, characterised in that

$$R \leq 2.7 \times \text{Tr}$$

4. (currently amended): Steel block according to ~~any of claims 1 to 3~~ claim 1, characterised in that the silicon content is strictly less than 0.45 % by weight and the carbon content less than or equal to 0.35 % by weight.

5. (currently amended): Steel block according to ~~any of claims 1 to 4~~ claim 1, characterised in that $R/(2.7 \times \text{Tr}) \leq 0.90$.

6. (original): Steel block according to claim 5; characterised in that $R/(2.7 \times \text{Tr}) \leq 0.80$.

7. (currently amended): Steel block according to ~~any of claims 1 to 6~~ claim 1, characterised in that $U/\text{Dr} < 9.0$.

8. (original): Steel block according to claim 7, characterised in that the composition is such that:

$$0.230\% \leq C \leq 0.350\%$$

$$\text{Si} \leq 0.30\%$$

$$0.1\% \leq \text{Mn} \leq 1.8\%$$

$$\text{Ni} \leq 2\%$$

$$0.2\% \leq \text{Cr} \leq 3\%$$

$$\text{Mo} + \text{W}/2 \leq 2.5\%$$

$$\text{V} + \text{Nb}/2 + \text{Ta}/4 \leq 0.3\%$$

$$\text{Mo}^* + 3\text{xV}^* \geq 0.8\%$$

9. (original): Steel block according to claim 8, characterised in that its composition is such that:

$$0.240\% \leq \text{C} \leq 0.320\%$$

$$\text{Si} \leq 0.15\%$$

$$0.1\% \leq \text{Mn} \leq 1.6\%$$

$$\text{Ni} \leq 2\%$$

$$0.2\% \leq \text{Cr} \leq 2.5\%$$

$$0.3\% \leq \text{Mo} + \text{W}/2 \leq 2.5\%$$

$$\text{V} + \text{Nb}/2 + \text{Ta}/4 \leq 0.3\%$$

$$\text{Mo}^* + 3\text{xV}^* \geq 1.2\%$$

10. (currently amended): Steel block according to ~~claim 8 or 9~~claim 8, characterised in that $\text{Tr} > 4.5$.

11. (currently amended): Steel mould part machined in a block according to ~~any of claims 1 to 10~~claim 1, of which at least a portion of the surface is hardened by nitriding and of which the hardness at all points is between 430 HB and 530 HB.